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10/729,582	12/06/2003	Benjamin Jian	AFC-002/RE	2222
27652	7590	10/26/2005		
JOSHUA D. ISENBERG 204 CASTRO LANE FREMONT, CA 94539			EXAMINER KANG, JULIANA K	
			ART UNIT 2874	PAPER NUMBER

DATE MAILED: 10/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/729,582

Applicant(s)

JIAN, BENJAMIN

Examiner

Juliana K. Kang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 13 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-36 and 39 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 and 39 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

***Reissue Applications***

1. Applicant's communication filed on June 13, 2005 has been carefully studied by the Examiner. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Thus this action is made **final**.

***Oath/Declaration***

2. Applicant submitted a corrected declaration and a defective reissue declaration under 35 U.S.C. 251 is hereby withdrawn.

***Claim Objections***

3. Claims 1-36 and 39 are objected because of the following informalities:  
According to 37 CFR 1.173, the amendments to be made in reissue application require underlining for added matter and bracketing for deleted matter in relation to the patent (i.e., not previous amendments). Thus, claims added in a reissue application are always required to be totally underlined. Also the amendment requires on a page(s) separate from the pages containing the changes, the status of all patent claims and of all added claims, and an explanation of the support in the disclosure of the patent for the changes made to the claims. Finally, the canceled claims should be without presentation of the text. Appropriate correction is required.

***Claim Rejections - 35 USC § 251***

4. Claims 30-35 and 39 are rejected under 35 U.S.C. 251 as being an improper recapture of broadened claimed subject matter surrendered in the application for the patent upon which the present reissue is based. See *Pannu v. Storz Instruments Inc.*, 258 F.3d 1366, 59 USPQ2d 1597 (Fed. Cir. 2001); *Hester Industries, Inc. v. Stein, Inc.*, 142 F.3d 1472, 46 USPQ2d 1641 (Fed. Cir. 1998); *In re Clement*, 131 F.3d 1464, 45 USPQ2d 1161 (Fed. Cir. 1997); *Ball Corp. v. United States*, 729 F.2d 1429, 1436, 221 USPQ 289, 295 (Fed. Cir. 1984). A broadening aspect is present in the reissue which was not present in the application for patent. The record of the application for the patent shows that the broadening aspect (in the reissue) relates to subject matter that applicant previously surrendered during the prosecution of the application. Accordingly, the narrow scope of the claims in the patent was not an error within the meaning of 35 U.S.C. 251, and the broader scope surrendered in the application for the patent cannot be recaptured by the filing of the present reissue application. Claims 30-33 are essentially same as the original claims 1, 6, 7, 10, 13 and 14, which are surrendered by applicant. Claims 34, 35, and 39 are essentially same as the original method claims 19-29. Such broader claim scope surrendered in the application for the patent cannot be recaptured by the filing of the present reissue application.

***Double Patenting***

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11

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F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. Claims 30-36 and 39 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1 and 19 of U.S. Patent No. 6,527,455 B2. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1 and 19 of the patent recite all of the structure and methods recited in claims 30-36 and 39 of the present application plus additional structure and methods. Although the claims are not identical, broader claims 30-36 and 39 of the present application are rendered obvious by the more specific claims of 1 and 19 of the patent.

### ***Claim Rejections - 35 USC § 103***

7. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

8. **Claims 7-9 and 30-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda (U.S. Patent 5,434,939) and further in view of Auda et al (U.S. Patent 5,223,914).**

Regarding claims 30 and 33, Matsuda disclose an optical fiber module comprising a first layer (203) having a socket (216) extending through the first layer and fiber socket sized to receive and align an optical fiber (216) (see Fig. 2). Matsuda teach using etching process to form the fiber socket. However, Matsuda does not specify the etching process. Auda et al teach dry etching technologies are rapidly displacing wet etching technology because the dry etching provides precise device fabrication (see column 1 lines 40-59). Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use any dry etching including deep reactive ion etching in Matsuda as taught by Auda et al for precise device fabrication.

Regarding claim 31, Matsuda shows a plurality of sockets (see Fig. 3c).

Regarding claim 32, Matsuda shows a second layer (202) that is affixed to the first layer (see Fig. 2).

Regarding claims 7-9, Matsuda teaches an optical coupler for coupling optical radiation between an optical device and an optical fiber, comprising: a first layer (203), said first layer defining a fiber socket (216) extending through the first layer, said fiber socket sized to receive and align said optical fiber therein; a second layer (202); said optical fiber (217) having an end section that extends through the fiber socket, said optical fiber terminating at an end face situated approximately adjacent to the second layer, said fiber socket aligning and positioning said optical fiber therein; and an optical device (204, 205, VCSEL) integrated into said second layer (see Fig. 2). Even though Konishi et al is silent about bonding the second layer to the first layer, bonding the two

layers of Konishi et al would have been to one with ordinary skill in the art at the time the invention was made to make the structure sturdier. Using a photodetector is necessary for detecting and further processing of optical signals. Thus, placing a photodetector in Konishi et al would have been obvious to detect or process optical signals with efficient optical coupling.

**9. Claims 1-7, 10-17 and 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konishi et al (JP 06-138341) and further in view of Auda et al (U.S. Patent 5,223,914).**

Regarding claims 1, Konishi et al disclose an optical coupler comprising: a first layer (5, silicon guide plate), said first layer defining a fiber socket (16) formed by photolithographic masking and etching to extend through said first layer (see [0016]), said fiber socket sized to receive and align said optical fiber therein (see [0014]); a second layer (11, transparent substrate) bonded (pasted) to said first layer (see [0015]), said optical fiber having an end section that extends through the fiber socket, said optical fiber terminating at an end face situated approximately adjacent to the second layer and said fiber socket aligning and positioning said optical fiber therein. Konishi et al disclose that the second layer is transparent substrate. However, Konishi et al do not specifically teach that the second layer has the refractive index that is substantially equal to the refraction index of the optical core. When coupling optical beam between an optical fiber and optical element, using a material having refractive index that is substantially equal to the refractive index of the optical core would provide the efficient

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optical coupling without spreading light beam between the optical fiber and the optical element. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the second layer with the refractive index that is substantially equal to the optical fiber core in Konishi et al in order to improve the optical coupling efficiency. Konishi et al also do not teach deep reactive ion etching. Auda et al teach dry etching technologies such as reactive ion etching (deep reactive ion etching) are rapidly displacing wet etching technology because the dry etching provides precise device fabrication. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use reactive ion etching in Konishi et al as taught by Auda et al for precise device fabrication.

Regarding claim 2, Konishi et al do not specific teach that the optical fiber is a single mode fiber. Using a single mode optical fiber is well known in the art. Since Konishi et al teach making the socket almost equal to the outer diameter of the optical fiber and not specify the types of optical fibers, using any type of optical fiber including a single mode optical fiber would have been obvious to one having ordinary skill in the art.

Regarding claim 3, Konishi et al disclose that the first layer is a single-crystal silicon layer (see [0009]).

Regarding claims 4 and 5, Konishi et al does not teach that the second layer comprises silicon or glass. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use either a silicon or glass for the second layer in Konishi et al, since it has been held to be within the general skill of a worker in



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the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice.

Regarding claim 6, Konishi et al teach fitting and adhering the optical fiber in the socket formed in the first layer and pasting the first layer to the second layer. This arrangement provides an epoxy between the optical fiber (first layer) and the second layer. Using the epoxy having an index of refraction that matches the index of the optical fiber in Konishi et al would have been obvious to one having ordinary skill in the art to provide the efficient optical coupling.

Regarding claim 7, as described above Konishi et al teach all the claimed limitations including an optical device (12) integrated into the second layer.

Regarding claims 10 and 11, as described above Konishi et al teach the claimed limitations including optical focusing element (12) having focal points approximately situated along the central axes of the fiber socket (see Fig. 1). However, Konishi et al do not teach that the focusing element is a gradient-index lens. A gradient-index lens is commonly used in the art to focus the light beam. Thus, using a gradient-index lens in Konishi et al would have been obvious to one having ordinary skill in the art at the time the invention was made to focus the light.

Regarding claim 12, Konishi et al do not specific teach that the optical fiber is a single mode fiber. Using a single mode optical fiber is well known in the art. Since Konishi et al teach making the socket almost equal to the outer diameter of the optical fiber and not specify the types of optical fibers, using any type of optical fiber including a single mode optical fiber would have been obvious to one having ordinary skill in the art.

Regarding claim 13, Konishi et al show a diffractive lens (12, see Fig. 1).

Regarding claims 14-17, as described above, Konishi et al teach all the claimed limitations except a third layer bonded to the second layer wherein the third layer comprising an optical device such as a VCSEL or focusing element. Since Konishi et al teaches further coupling of a semiconductor laser (1) and a focusing element (2), using additional layer to accommodate optical device such as VCSEL or lenses in Konishi et al would have been obvious to one having ordinary skill in the art at the time the invention was made to make the device more compact and easier to align.

Regarding claims 30-35, Konishi et al disclose the claimed coupler comprising a first layer (5) said first layer having a plurality of sockets (16) formed by masking and etching to extend through said first layer, said fiber socket sized to receive and align an optical fiber therein. Konishi et al disclose that the first layer (5) and a second layer (4) that are pasted to each other. However, Konishi et al do not teach deep reactive ion etching. Auda et al teach dry etching technologies such as reactive ion etching (deep reactive ion etching) are rapidly displacing wet etching technology because the dry etching provides precise device fabrication. Thus, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use reactive ion etching in Konishi et al as taught by Auda et al for precise device fabrication.

**10. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsuda and Auda et al (U.S. Patent 5,223,914) and further in view of Kakii et al (EP 0 405 620 A2).**

Matsuda and Auda et al teach all the claimed limitations except dicing a composite wafer (bonded first and second layer). Kakii et al teach making a plurality of optical fiber coupling member by dicing substrate plate wafer comprising optical fiber coupling members into a plurality of chips of optical fiber coupling members. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method of dicing the wafer into a plurality of chips of optical coupler for massive production of couplers with low manufacturing cost.

**11. Claims 20-29, 36 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Konishi et al and Auda et al (U.S. Patent 5,223,914) and further in view of Kakii et al (EP 0 405 620 A2).**

Konishi et al and Auda et al teach all the claimed limitations except a type of bonding between the first and second layer and dicing a composite wafer (bonded first and second layer). Using any type of known bonding including soldering, epoxy and anodic bonding would have been obvious to use in Konishi et al to attach two layers together. Kakii et al teach making a plurality of optical fiber coupling member by dicing substrate plate wafer comprising optical fiber coupling members into a plurality of chips of optical fiber coupling members. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the method of dicing the wafer into a plurality of chips of optical coupler for massive production of couplers with low manufacturing cost. Konishi et al teach inserting the fiber into fiber sockets and adhering (affixing)(see abstract).

***Response to Arguments***

12. Applicant's arguments with respect to claims 1-39 have been considered but are moot in view of the new ground(s) of rejection. However regarding claims rejections under 35 USC 251, applicant argues that there is no recapture with respect to claims 30-38. The Examiner does not agree with this. The filing of the continuation has no effect on the issue of recapture. Thus as discussed above, the claims are still rejected under 35 USC 251.

***Conclusion***

13. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Juliana K. Kang whose telephone number is (571) 272-2348. The examiner can normally be reached on Mon. & Fri. 10:00-6:00 and Tue. & Thur. 10:00-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Rod Bovernick can be reached on (571) 272-2344. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

**JULIANA KANG**  
**PRIMARY EXAMINER**

*Juliana Kang*  
*10/25/05*